NEBRASKA ADMINISTRATIVE CODE

Title 117 - NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

Chapter 4 - STANDARDS FOR WATER QUALITY

001 It is the public policy of the State of Nebraska to protect and improve the quality of surface water for human consumption, wildlife, fish and other aquatic life, industry, recreation, and other productive, beneficial uses.

Beneficial uses are assigned to surface waters within or bordering upon the State of Nebraska (Chapters 5 and 6). Assigned and existing beneficial uses are protected by the Antidegradation Clause (Chapter 3) and the narrative and numerical water quality criteria in this chapter. Beneficial uses are also protected by permits issued in accordance with the requirements of these standards, and through Department requirements for the applicable level of treatment or control for point and nonpoint sources of pollution. Some uses require higher quality water than others. When multiple uses are assigned to the same waters, all assigned uses will be protected.

The beneficial uses defined by these standards are:

Primary Contact Recreation

Aquatic Life

Coldwater (Class A and B)
Warmwater (Class A and B)

Water Supply

Public Drinking Water
Agricultural
Industrial

Aesthetics

These uses are not intended in any way to conflict with the quantitative beneficial uses provided for in Neb. Rev. Stat., Ch. 46, regulating irrigation or the authority of the Nebraska Department of Natural Resources.

002 Primary Contact Recreation.

This use applies to surface waters which are used, or have a high potential to be used, for primary contact recreational activities. Primary contact recreation includes activities where the body may come into prolonged or intimate contact with the water, such that water may be accidentally ingested and sensitive body organs (e.g., eyes, ears, nose, etc.) may be exposed. Although the water may be accidentally ingested, it is not intended to be used as a potable water supply unless acceptable treatment is applied. These waters may be used for swimming, water skiing, canoeing, and similar activities. These criteria apply during the recreational period of May 1 through September 30.

002.01 *E. coli.*

E. coli bacteria shall not exceed a geometric mean of 126/100 ml. For increased confidence of the criteria, the geometric mean should be based on a minimum of five samples taken within a 30-day period. This does not preclude fecal coliform limitations based on effluent guidelines. The following single sample maxima shall be used solely for issuing periodic public advisories regarding use of waterbodies for Primary Contact Recreation.

002.01A 235/100 ml at designated bathing beaches.

002.01B 298/100 ml at moderately used recreational waters.

002.01C 406/100 ml at lightly used recreational waters.

002.01D 576/100 ml at infrequently used recreational waters.

003 Aquatic Life.

003.01 General Criteria for Aquatic Life

The following criteria apply to all aquatic life use classes.

003.01A pH (Hydrogen Ion Concentration).

Hydrogen Ion concentrations, expressed as pH, shall be maintained between 6.5 and 9.0; unless pH values outside this range are due to natural conditions.

003.01B Temperature.

The temperature of a receiving water shall not be increased by a total of more than 5°F (3°C) from natural background outside the mixing zone.

For the Missouri River, from the South Dakota-Nebraska state line near Ft. Randall Dam to Sioux City, Iowa, the maximum temperature limit is 85°F (29°C) with an allowable change of 4°F (2°C) from natural background. For cold waters, the maximum limit is 72°F (22°C) with an allowable change of 5°F (3°C) from natural background. For warm waters, the maximum limit is 90°F (32°C).

For impoundments, the temperature of the epilimnion of surface waters shall not be raised more than 3°F (2°C) above that which existed before the addition of heat of artificial origin. Unless a special study shows that the discharge of heated effluent into the hypolimnion will be desirable, such practice is not recommended and water for cooling should not be pumped from the hypolimnion to be discharged to the same body of water.

003.01C Toxic Substances.

Surface waters shall be free from toxic substances, alone or in combination with other substances, in concentrations that result in acute or chronic toxicity to aquatic life, except as specified in Chapter 2. Toxic substances shall not be present in concentrations that result in objectionable tastes or significant bioaccumulation or biomagnification in aquatic organisms which renders them unsuitable or unsafe for consumption. (In implementing these criteria, the Department will follow procedures outlined in the State's Continuing Planning Process which comply with the federal water quality standards, 40 C.F.R. § 131.11 (1987)).

003.01C1 The following numerical criteria for the protection of aquatic life and their uses (e.g., fish consumption) shall not be exceeded. Unless otherwise noted, criteria are based on total concentrations.

POLLUTANT	CRITERIA (ug/l) Acute	Chronic	CAS No.*
Pesticides:			
Acrolein	68[a]	21[b]	107028
Alachlor	760[c]	76[d]	15972608
Aldrin	3.0[a]	0.00136[b,e]	309002
Atrazine	330[c]	12[d]	1912249
BHC[1]	100[a]	0.414[b,e]	319868
Alpha-BHC	(Reserved)	0.131[b,e]	319846
Beta-BHC	(Reserved)	0.46[b,e]	319857
Chlordane	2.4[a]	0.0043[b]	57749
Chlorpyrifos	0.083[c]	0.041[d]	2921882
DCPA[3]	(Reserved)	14,300[d]	1861321
DDT[4]	1.1[a]	0.001[b]	50293
DDT metabolite (DDE)	1050[a]	0.0059[b,e]	72559
DDT metabolite (TDE, DDD)	0.6[a]	0.0084[b,e]	72548
Demeton	(Reserved)	0.1[b]	8065483
Dieldrin	0.24[a]	0.00144[b,e]	60571
Dioxin[5]	< 0.01[a]	< 0.00000014[b,e]	1746016
Alpha-Endosulfan	0.22[a]	0.056[b]	959988
Beta-Endosulfan	0.22[a]	0.056[b]	33213659
Endosulfan sulfate	(Reserved)	240[b,f]	1031078
Endrin	0.086[a]	0.036[b]	72208
Endrin aldehyde	(Reserved)	0.81[b,f]	7421934
Guthion	(Reserved)	0.01[b]	86500
Heptachlor	0.52[a]	0.00214[b,e]	76448
Heptachlor epoxide	0.52[a]	0.0011[b,e]	1024573
Isophorone	117,000[a]	26,000[b,e]	78591
Lindane[2]	0.95[a]	0.16[b]	58899
Malathion	(Reserved)	0.1[b]	121755
Methoxychlor	(Reserved)	0.03[b]	72435
Metolachlor	390[c]	100[d]	51218452
Metribuzin	(Reserved)	100[d]	21087649

POLLUTANT	CRITERIA (ug/l) Acute	CRITERIA (ug/l) Chronic	CAS No.*
Mirex	(Reserved)	0.001[d]	2385855
Parathion	0.065[c]	0.013[d]	56382
Pentachlorophenol	$e^{(1.005(pH)-4.869)}$ [c]	$e^{(1.005(pH)-5.134)}$ [d]	87865
Propachlor	(Reserved)	8.0[d]	1918167
Toxaphene	0.73[c]	0.0002[d]	8001352
Tributyltin (TBT)	0.46[c]	0.072[d]	.....
Metals and Inorganics[6] :			
Aluminum	750[c]	87[d]	7429905
Antimony	88[c]	30[d]	7440360
Arsenic	340[c]	16.7[b,e]	7440382
Beryllium	130[a]	5.3[d]	7440417
Cadmium	(See Site-Specific or Aquatic Life Use Class Criteria)		7440439
Chromium (III)	(See Site-Specific or Aquatic Life Use Class Criteria)		16065831
Chromium (VI)	(See Site-Specific or Aquatic Life Use Class Criteria)		18540299
Copper	$(0.960)e^{(0.9422[\ln hardness]-1.700)}$ [c]	$(0.960)e^{(0.8545[\ln hardness]-1.702)}$ [d]	7440508
Cyanide	(See Site-Specific or Aquatic Life Use Class Criteria)		57125
Iron	(Reserved)	1,000[b]	7439896
Lead[7]	$(CF)e^{(1.273[\ln hardness]-1.460)}$ [c]	$(CF)e^{(1.273[\ln hardness]-4.705)}$ [d]	7439921
Manganese	(Reserved)	1,000[b,e]	7439965
Mercury[8]	1.4[c]	0.77[d]	7439976
Nickel	$(0.998)e^{(0.846[\ln hardness]+2.255)}$ [c]	$(0.997)e^{(0.846[\ln hardness]+0.0584)}$ [d]	7440020
Selenium[9]	20[c]	5.0[d]	7782492
Silver	$(0.85)e^{(1.72[\ln hardness]-6.52)}$ [c]	(Reserved)	7440224
Thallium	1400[a]	6.3[b,f]	7440280
Zinc	$(0.978)e^{(0.8473[\ln hardness]+0.884)}$ [c]	$(0.986)e^{(0.8473[\ln hardness]+0.884)}$ [d]	7440666
PCBs and Related Compounds:			
PCBs	2.0[a]	0.0017[b,e]	1336363
Chlorinated Naphthalenes	1,600[a]	43,000[b,e]	.....

POLLUTANT	CRITERIA (ug/l) Acute	Chronic	CAS No.*
Halogenated Aliphatics:			
Halomethanes	11,000[a]	157[b,e]	.....
Bromoform	(Reserved)	3,600[b,e]	75252
Methyl bromide	(Reserved)	4,000[b,f]	74839
Chloroform	28,900[a]	1,240[b]	67663
Carbon tetrachloride	35,200[a]	44.2[b,e]	56235
Methylene chloride	(Reserved)	16,000[b,e]	75092
1,2-dichloroethane	118,000[a]	986[b,e]	107062
Hexachloroethane	980[a]	89.5[b,e]	67721
Pentachloroethane	7,240[a]	1,100[b]	76017
Trichlorinated ethanes	18,000[a]	(Reserved)	25323891
1,1,2-trichloroethane	(Reserved)	419.9[b,e]	79005
Tetrachloroethanes	9,320[a]	(Reserved)	25322207
1,1,2,2-tetrachloroethane	(Reserved)	110[b,e]	79345
Dichloroethylenes	11,600[a]	(Reserved)	25323303
1,1-dichloroethylene	(Reserved)	32[b,e]	75354
1,2-trans-dichloroethylene	(Reserved)	140,000[b,f]	156605
Tetrachloroethylene	5,280[a]	88.5[b,e]	127184
Trichloroethylene	45,000[a]	810[b,e]	79016
Chlorodibromomethane	(Reserved)	340[b,e]	124481
Dichlorobromomethane	(Reserved)	460[b,e]	75274
Dichloropropane	23,000[a]	5,700[b]	26638197
1,2-dichloropropane	(Reserved)	390[b,e]	78875
Dichloropropene	6,060[a]	244[b]	26952238
1,3-dichloropropylene	(Reserved)	1,700[b,f]	542756
Hexachlorobutadiene	90[a]	9.3[b]	87683
Hexachlorocyclopentadiene	7.0[a]	5.2[b]	77474
Vinyl Chloride	(Reserved)	5,250[b,e]	75014
Ethers:			
Bis(2-chloroethyl)ether	(Reserved)	14[b,e]	111444
Bis(2-chloroisopropyl)ether	(Reserved)	170,000[b,f]	39638329
Bis chloromethyl ether	(Reserved)	0.0078[b,e]	542881
Chloroalkyl ethers	238,000[a]	(Reserved)	.....
Haloethers	360[a]	122[b]	.....

POLLUTANT	CRITERIA (ug/l) Acute	Chronic	CAS No.*
Monocyclic Aromatics except Phenols, Cresols, and Phthalates:			
Benzene	5,300[a]	712.8[b,e]	71432
Chlorinated benzenes	250[a]	50[b]	.....
Dichlorobenzenes	1,120[a]	763[b]	25321226
Ethylbenzene	32,000[a]	29,000[b,f]	100414
Hexachlorobenzene	6.0[a]	0.0077[b,e]	118741
Nitrobenzene	27,000[a]	1,900[b,f]	98953
Pentachlorobenzene	(Reserved)	41[b,e]	608935
1,2,4,5-tetrachlorobenzene	(Reserved)	29[b,e]	95943
1,2,4-trichlorobenzene	(Reserved)	940[b,f]	120821
Toluene	17,500[a]	200,000[b,f]	108883
2,4-dinitrotoluene	330[a]	91[b,e]	121142
Phenols and Cresols:			
Phenol	10,200[a]	2,560[b]	108952
2-chlorophenol	4,380[a]	400[b,f]	95578
3-methyl-4-chlorophenol	30[a]	(Reserved)	59507
2,4-dichlorophenol	2,020[a]	365[b]	120832
2,4,5-trichlorophenol	100[a]	63[b]	95954
2,4,6-trichlorophenol	(Reserved)	65[b,e]	88062
Dinitrophenols	(Reserved)	140,000[b,e]	25550587
Nitrophenols	230[a]	150[b]	.....
2-methyl-4,6-dinitrophenol	(Reserved)	765[b,f]	534521
2,4-dinitrophenol	(Reserved)	14,000[b,f]	51285
2,4-dimethylphenol	2,120[a]	2,300[b,f]	105679
Phthalate Esters:			
Phthalate esters	940[a]	3.0[b]	.....
Butylbenzyl phthalate	(Reserved)	5,200[b,f]	85687
Di-N-butyl phthalate	(Reserved)	12,000[b,f]	84742
Diethyl phthalate	(Reserved)	120,000[b,f]	84662
Di-2-ethylhexyl phthalate	2,000[a]	59.2[b,e]	117817
Dimethyl phthalate	(Reserved)	29,000,000[b,e]	131113

POLLUTANT	CRITERIA (ug/l) Acute	Chronic	CAS No.*
Polycyclic Aromatic Hydrocarbons (PAHs):			
Acenaphthene	1,700[a]	520[b]	83329
Anthracene	(Reserved)	110,000[b,f]	120127
Benzo(a)anthracene	(Reserved)	0.49[b,e]	56553
Benzo(a)pyrene	(Reserved)	0.49[b,e]	50328
Benzo(b)fluoranthene	(Reserved)	0.49[b,e]	205992
Benzo(k)fluoranthene	(Reserved)	0.49[b,e]	207089
Chrysene	(Reserved)	0.49[b,e]	218019
Dibenzo(a,h)anthracene	(Reserved)	0.49[b,e]	53703
Fluoranthene	3,980[a]	370[b,f]	206440
Fluorene	(Reserved)	14,000[b,f]	86737
Ideno(1,2,3-cd)pyrene	(Reserved)	0.49[b,e]	193395
Naphthalene	2,300[a]	620[b]	91203
2-chloronaphthalene	1,600[a]	4,300[b,f]	91587
Phenanthrene	30[a]	6.3[b]	85018
Pyrene	(Reserved)	11,000[b,f]	129000
Nitrosamines and other Nitrogen-containing Compounds:			
Nitrosamines	5,850[a]	12.4[b,e]	35576911
Benzidine	2,500[a]	0.00535[b,e]	92875
3,3-dichlorobenzidine	(Reserved)	0.77[b,e]	91941
1,2-diphenylhydrazine	270[a]	5.4[b,e]	122667
Acrylonitrile	7,550[a]	6.65[b,e]	107131
N-nitrosodibutylamine	(Reserved)	5.87[b,e]	924163
N-nitrosodiethylamine	(Reserved)	12.4[b,e]	55185
N-nitrosodimethylamine	(Reserved)	81[b,e]	62759
N-nitrosodiphenylamine	(Reserved)	160[b,e]	86306
N-nitrosodi-N-propylamine	(Reserved)	14.0[b,e]	621647
N-nitrosopyrrolidine	(Reserved)	919[b,e]	930552

* Chemical Abstract Services Registry Number

[a] Concentration not to be exceeded at any time
[b] Twenty-four hour average concentration
[c] One-hour average concentration

[d] Four-day average concentration
[e] Human health criteria at the 10^{-5} risk level for carcinogens based on the consumption of fish and other aquatic organisms
[f] Human health criteria based on the consumption of fish and other aquatic organisms

[1] Benzene hexachloride or hexachlorocyclohexane
[2] Gamma-BHC
[3] Dimethyl tetrachloroterephthalate
[4] Dichlorodiphenyltrichloroethane
[5] 2,3,7,8-tetrachloro-dibenzo-p-dioxin or 2,3,7,8-TCDD
[6] Criteria for metals and inorganics apply to dissolved concentrations
[7] The conversion factor for lead (acute and chronic) is hardness dependent and defined by:
CF = 1.46203 - [(ln *hardness*)(0.145712)]
[8] Chronic criterion for mercury applies to total recoverable concentrations
[9] Criteria for selenium apply to total recoverable concentrations

003.01C2 The following criteria for the protection of human health based on consumption of fish and other aquatic organisms shall not be exceeded. These criteria are expressed as fish tissue concentrations (mg/kg fish).

POLLUTANT	CRITERIA (mg/kg)	CAS No.*
Methylmercury	0.215	22967926

* Chemical Abstract Services Registry Number

003.01D Petroleum Oil.

Not to exceed 10 mg/l.

003.01E Total Dissolved Gases.

Not to exceed 110 percent of the saturation value for gases at the existing atmospheric and hydrostatic pressures.

003.01F Hydrogen Sulfide.

Not to exceed 0.002 mg/l as undissociated hydrogen sulfide.

003.01G Chloride.

Not to exceed 860 mg/l at any time or a four-day average concentration of 230 mg/l except as specified in 003.02B5b and 003.02B6a (Site-specific criteria).

003.01H Alkalinity

No less than 20 mg/l as $CaCO_3$ except where natural background is less.

003.01I Residual Chlorine.

003.01I1 One-hour average concentration not to exceed 19 ug/l.

003.01I2 Four-day average concentration not to exceed 11 ug/l.

003.01J Biological Criteria.

Any human activity causing water pollution which would significantly degrade the biological integrity of a body of water or significantly impact or displace an identified “key species” shall not be allowed except as specified in Chapter 2.

003.01J1 Key Species.

Key species are identified endangered, threatened, sensitive, or recreationally-important aquatic species. Key species are designated by stream segment (Chapter 5). The following list defines the aquatic species considered by the Department to be key species.

COMMON NAME	SCIENTIFIC NAME
Endangered Species:	
Pallid sturgeon	*Scaphirhynchus albus*
Topeka shiner	*Notropis topeka*
Sturgeon chub	*Macrhybopsis gelida*
Blacknose shiner	*Notropis heterolepis*
Scaleshell mussel	*Leptodea leptodon*
Threatened Species:	
Lake sturgeon	*Acipenser fulvescens*
Northern redbelly dace	*Phoxinus eos*
Finescale dace	*Phoxinus neogaeus*
Sensitive Species[1]:	
Lake chub	*Couesius plumbeus*
Brook stickleback	*Culea inconstans*
Iowa darter	*Etheostoma exile*
Johnny darter	*Etheostoma nigrum*
Orangethroat darter	*Etheostoma spectabile*
Blacknose dace	*Rhinichthys atratulus*
Pearl Dace	*Semotilus margarita*
Grass pickerel	*Esox americanus*
Pumpkinseed	*Lepomis gibbosus*
Golden shiner	*Notemigonus crysoleucas*
Common shiner	*Notropis cornutus*

[1] Endangered, threatened, and recreationally-important aquatic species are not included.

COMMON NAME	SCIENTIFIC NAME
Recreationally-Important Species:	
Shovelnose sturgeon	*Scaphirhynchus platorynchus*
Paddlefish	*Polyodon spathula*
Brook trout	*Salvelinus fontinalis*
Brown trout	*Salmo trutta*
Rainbow trout	*Oncorhynchus mykiss*
Northern pike	*Esox lucius*
Muskellunge	*Esox masquinongy*
Blue catfish	*Ictalurus furcatus*
Channel catfish	*Ictalurus punctatus*
Flathead catfish	*Pylodictis olivaris*
Striped bass	*Morone saxatilis*
White bass	*Morone chrysops*
Rock bass	*Ambloplites rupestris*
Largemouth bass	*Micropterus salmoides*
Smallmouth bass	*Micropterus dolomieui*
Spotted bass	*Micropterus punctulatus*
Redear sunfish	*Lepomis microlophus*
Bluegill	*Lepomis macrochirus*
Black crappie	*Pomoxis nigromaculatus*
White crappie	*Pomoxis annularis*
Yellow perch	*Perca flavescens*
Sauger	*Stizostedion canadense*
Walleye	*Stizostedion vitreum vitreum*

003.02 Site-Specific Criteria for Aquatic Life.

003.02A Procedures for Developing Site-specific Water Quality Criteria.

The water quality criteria in Chapter 4 may not always reflect the toxicity of a chemical in a specific water body. These criteria also represent only a limited number of the natural and manmade chemicals that exist in the environment which may pose a threat to aquatic life. Thus, it may be necessary in some water bodies to develop new water quality criteria or modify existing criteria through site-specific analyses in order to more accurately protect the resident species.

003.02A1 The following are acceptable conditions for developing site-specific criteria.

003.02A1a Resident species of a water body are more or less sensitive than those species used to develop a water quality criterion.

003.02A1a(1) Natural adaptive processes have enabled a viable, balanced aquatic community to exist in waters where natural background levels of a chemical exceed the criterion (e.g., resident species have evolved a genetically-based greater resistance to high concentrations of a chemical).

003.02A1a(2) The composition of aquatic species in a water body is different from those used in deriving a criterion (e.g., most of the species considered among the most sensitive, such as salmonids or the cladoceran, Daphnia magna, which were used in developing a criterion, are absent from a water body).

003.02A1b Biological availability and/or toxicity of a chemical may be altered due to differences between the physical and/or chemical characteristics of the water in a water body and the laboratory water used in developing a criterion (e.g., alkalinity, hardness, pH, salinity, suspended solids, turbidity, water temperature).

003.02A1b(1) The effect of seasonality on the physical and/or chemical characteristics of a water body and subsequent effects on biological availability and/or toxicity of a chemical may justify seasonally dependent site-specific criteria.

003.02A2 To insure that the approach to be used in developing site-specific criteria is acceptable, the Department should be involved early in the planning of any site-specific analyses so that an agreement can be reached concerning the availability of existing data, additional data needs, methods to be used in generating new data, testing procedures to be used, schedules to be followed, and quality control and assurance provisions to be used. It is particularly important to involve the Department in the planning of site-specific analyses if a party other than the Department will be conducting the data generation and testing.

003.02A3 Site-specific criteria shall protect all life stages of resident species year-round (or seasonally for seasonally dependent criteria) and prevent acute and chronic toxicity in all parts of a water body. If site-specific criteria are seasonally dependent, the period when the criteria apply shall be clearly identified.

003.02A4 Site-specific criteria shall include both chronic and acute concentrations to better reflect the different tolerances of resident species to the inherent variability between concentrations and toxicological characteristics of a chemical.

003.02A5 Site-specific criteria shall be clearly identified as maximum "not to be exceeded" or average values, and if an average, the averaging period. The conditions, if any, when the criteria apply shall be clearly stated (e.g., specific levels of hardness, pH, or water temperature). Specific sampling requirements (e.g., location, frequency), if any, shall also be identified.

003.02A6 The following are acceptable procedures for developing site-specific criteria.

003.02A6a Site-specific analyses for the development of new water quality criteria shall be conducted in a manner which is scientifically justifiable and consistent with the assumptions and rationale in Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses, EPA, 1985.

003.02A6b Site-specific analyses for the modification of existing water quality criteria shall be conducted in accordance with one of the following procedures. These procedures are described in Water Quality Standards Handbook, EPA, December 1983.

003.02A6b(1) Recalculation procedure. This procedure is used to account for differences in sensitivity to a chemical between resident species and those species used in deriving the criterion. Bioassays in laboratory water may be required for untested resident species. Adaptation of numerical toxics criteria to site-specific conditions is explained in Recalculation of State Toxic Criteria, EPA, November 1983.

003.02A6b(2) Indicator species procedure. This procedure is used to account for differences in biological availability and/or toxicity of a chemical between the physical and/or chemical characteristics of the water in a water body and the laboratory water used in developing the criterion. Bioassays in site water using resident species or acceptable nonresident species are required. Reconditioned laboratory water simulating site-specific water quality conditions is an acceptable substitute for site water.

003.02A6b(3) Resident species procedure. This procedure is used to account for differences in both resident species sensitivity and biological availability and/or toxicity of a chemical. Bioassays in site water using resident species are required. Reconditioned laboratory water simulating site-specific water quality conditions is an acceptable substitute for site water.

003.02A6b(4) Other scientifically defensible procedures such as relevant aquatic field studies, laboratory tests, or available scientific literature.

003.02A6b(4)(a) Deviations from EPA procedures shall have justifications which are adequately documented and based on sound scientific rationale.

003.02A6b(4)(b) The data, testing procedures, and application (safety) factors used to develop site-specific criteria shall reflect the nature of the chemical (e.g., persistency, bioaccumulation potential, and avoidance or attraction responses in fish) and the most sensitive resident species of a water body.

003.02A7 A site may be limited to the specific area affected by a point or nonpoint source of pollution; or, if water quality effects on toxicity are not a consideration, the site may be as large as a general biogeographical area permits (e.g., ecoregion, river basin, subbasin). For a number of different water bodies to be designated as one site, their respective aquatic communities cannot vary substantially in sensitivity to a chemical.

003.02B Site-Specific Water Quality Criteria.

003.02B1 Lake Ogallala (Keith County).

003.02B1a Dissolved Oxygen.

The following criteria shall apply from July 1 through October 15 as specified below. When the Kingsley Hydropower Plant is in operation (generating electricity), these criteria are based on water temperature measurements taken continuously and averaged every hour in the power house of the Kingsley Hydropower Plant and on dissolved oxygen measurements taken continuously and averaged every 10 minutes from Lake Ogallala at the midpoint of the buoy line (1987 location at the outer edge of the stilling basin) at a one meter depth. For purposes of calculating seven-day mean, seven-day mean minimum, and thirty-day mean values at the buoy line, seven-day and thirty-day calculation periods shall be based on a sequence of days not to include any day in which the Kingsley Hydropower Plant is not in operation. The following criteria may also be based on temperature and dissolved oxygen measurements taken from Lake Ogallala at any location except the metalimnion and hypolimnion when the lake exhibits thermal stratification.

003.02B1a(1) When daily mean water temperatures are 18°C or less the following criteria shall apply:

003.02B1a(1)(a) One-day minimum of not less than 3.0 mg/l.

003.02B1a(1)(b) Daily mean of not less than 4.0 mg/l and no more than 20 percent of the one-day mean values shall be less than 4.2 mg/l.

003.02B1a(1)(c) Seven-day mean of not less than 4.3 mg/l.

003.02B1a(2) When daily mean water temperatures exceed 18°C for four consecutive days of operation, the following criteria shall apply for as long as daily mean water temperatures continue to exceed 18°C. These criteria take effect on the fifth day of daily mean water temperatures exceeding 18°C.

003.02B1a(2)(a) One-day minimum of not less than 4.0 mg/l.

003.02B1a(2)(b) Daily mean of not less than 5.0 mg/l.

003.02B1a(3) When daily mean water temperatures exceed 18°C for fifteen consecutive days of operation, or when daily mean water temperatures exceed 20°C the dissolved oxygen criteria for Class B - Coldwater Aquatic Life (Chapter 4, 003.03B1) shall apply for as long as daily mean water temperatures continue to exceed 18°C. These criteria take effect on the sixteenth day of daily mean water temperatures exceeding 18°C or on the first day after daily mean water temperatures exceed 20°C.

003.02B1a(4) In implementing paragraphs 003.02B1a(2) and 003.02B1a(3), if an interruption in the operation of Kingsley Hydropower Plant exceeding 24 hours occurs during the count of days leading to a change in criteria, the count of days shall be suspended until the plant is back in operation. The first new day of operation shall be counted as the next consecutive day in the original count of days.

003.02B1b Dissolved oxygen criteria for Class B - Coldwater Aquatic Life (Chapter 4, 003.03B1) shall apply during the period of October 16 through June 30.

003.02B2 Platte River - Confluence of North and South Platte Rivers to Missouri River (segments MP1-10000, MP1-20000, MP2-10000, MP2-20000, MP2-30000, and MP2-40000, Middle Platte River Basin; segments LP1-10000 and LP1-20000, Lower Platte River Basin); Salt Creek - Hickman Branch to Beal Slough (segment LP2-30000, Lower Platte River Basin); Wood River - Grand Island Utilities Ditch to Platte River (segment MP2-10100, Middle Platte River Basin); Loup River - Loup River Canal Diversion to Platte River (segments LO1-10000 and LO1-20000, Loup River Basin); and Republican River - Frenchman Creek to Nebraska-Kansas border (Sec 32-1N-6W) (segments RE1-10000, RE1-20000, RE1-30000, RE1-40000, RE1-50000, RE2-10000, RE3-10000, and RE3-20000, Republican River Basin).

003.02B2a Total Ammonia (as nitrogen).

003.02B2a(1) One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (8.54)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.02B2a(1)(a) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	47.61
6.8	42.68
7.0	36.68
7.2	30.02
7.4	23.35
7.6	17.31
7.8	12.34
8.0	8.54
8.2	5.82
8.4	3.95
8.6	2.69
8.8	1.87
9.0	1.35

003.02B2a(2) Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 0.854\left(\text{Minimum of } \left\{2.85,\ \text{or } 1.45\cdot 10^{0.028\,(25\ -\ Temp)}\right\}\right)$$

during periods when early life stages are present (March through October), or

$$CCC = 0.854\left(1.45\cdot 10^{0.028\left(25\ -\ \text{Maximum of } \left\{Temp,\ \text{or } 7\right\}\right)}\right)$$

during periods when early life stages are absent (November through February.

003.02B2a(2)(a) The highest four-day average concentration within a thirty-day period shall not exceed 2.5 times the thirty-day criterion.

003.02B2a(2)(b) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs for periods when early life stages are present (March through October) and when early life stages are absent (November through February).

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)

Italicized numbers in parentheses apply when Early Life Stages are Absent (November through February). Early Life Stage Absent criteria are identical to Early Life Stages Present criteria at temperatures greater than 14.5°C.

Temperature (°C)	pH 6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
2.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
4.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
6.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
8.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(9.99)	*(9.58)*	*(9.00)*	*(8.20)*	*(7.21)*	*(6.05)*	*(4.84)*	*(3.70)*	*(2.73)*	*(1.96)*	*(1.40)*	*(1.01)*	*(0.74)*
10.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(8.79)	*(8.42)*	*(7.91)*	*(7.21)*	*(6.33)*	*(5.32)*	*(4.26)*	*(3.26)*	*(2.40)*	*(1.73)*	*(1.23)*	*(0.88)*	*(0.65)*
12.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(7.72)	*(7.40)*	*(6.95)*	*(6.34)*	*(5.57)*	*(4.68)*	*(3.74)*	*(2.86)*	*(2.11)*	*(1.52)*	*(1.08)*	*(0.78)*	*(0.57)*
14.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(6.79)	*(6.51)*	*(6.11)*	*(5.57)*	*(4.89)*	*(4.11)*	*(3.29)*	*(2.52)*	*(1.85)*	*(1.33)*	*(0.95)*	*(0.68)*	*(0.50)*
15.0	6.36	6.10	5.73	5.22	4.59	3.85	3.08	2.36	1.74	1.25	0.89	0.64	0.47
16.0	5.97	5.72	5.37	4.90	4.30	3.61	2.89	2.21	1.63	1.17	0.84	0.60	0.44
18.0	5.25	5.03	4.72	4.31	3.78	3.18	2.54	1.94	1.43	1.03	0.73	0.53	0.39
20.0	4.61	4.42	4.15	3.78	3.32	2.79	2.23	1.71	1.26	0.91	0.65	0.46	0.34
22.0	4.05	3.89	3.65	3.33	2.92	2.45	1.96	1.50	1.11	0.80	0.57	0.41	0.30
24.0	3.56	3.42	3.21	2.92	2.57	2.16	1.73	1.32	0.97	0.70	0.50	0.36	0.26
26.0	3.13	3.00	2.82	2.57	2.26	1.90	1.52	1.16	0.86	0.62	0.44	0.32	0.23
28.0	2.75	2.64	2.48	2.26	1.98	1.67	1.33	1.02	0.75	0.54	0.39	0.28	0.20
30.0	2.42	2.32	2.18	1.99	1.74	1.47	1.17	0.90	0.66	0.48	0.34	0.24	0.18

003.02B3 Big Blue River - Lincoln Creek to Nebraska-Kansas border (Sec 35-1N-7E) (segments BB1-10000, BB1-20000, BB4-10000, and BB4-20000, Big Blue River Basin); Union Creek - Taylor Creek to Elkhorn River (segments EL1-21900 and EL1-22000, Elkhorn River Basin); and Lost Creek - Shonka Ditch to Platte River (segment LP1-21000, Lower Platte River Basin).

003.02B3a Total Ammonia (as nitrogen).

003.02B3a(1) One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (9.91)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.02B3a(1)(a) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	55.25
6.8	49.53
7.0	42.57
7.2	34.84
7.4	27.09
7.6	20.09
7.8	14.32
8.0	9.92
8.2	6.75
8.4	4.58
8.6	3.13
8.8	2.18
9.0	1.56

003.02B3a(2) Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 0.854\left(\text{Minimum of } \left\{2.85,\ \text{or } 1.45\cdot 10^{0.028\,(25\ -\ Temp)}\right\}\right)$$

during periods when early life stages are present (March through October), or

$$CCC = 0.854\left(1.45\cdot 10^{0.028\left(25\ -\ \text{Maximum of } \{Temp,\ \text{or } 7\}\right)}\right)$$

during periods when early life stages are absent (November through February.

003.02B3a(2)(a) The highest four-day average concentration within a thirty day period shall not exceed 2.5 times the thirty-day criterion.

003.02B3a(2)(b) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs for periods when early life stages are present (March through October) and when early life stages are absent (November through February).

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)
Italicized numbers in parentheses apply when Early Life Stages are Absent (November through February). Early Life Stage Absent criteria are identical to Early Life Stages Present criteria at temperatures greater than 14.5°C.

Temperature (°C)	pH 6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
2.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
4.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
6.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
8.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(9.99)	*(9.58)*	*(9.00)*	*(8.20)*	*(7.21)*	*(6.05)*	*(4.84)*	*(3.70)*	*(2.73)*	*(1.96)*	*(1.40)*	*(1.01)*	*(0.74)*
10.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(8.79)	*(8.42)*	*(7.91)*	*(7.21)*	*(6.33)*	*(5.32)*	*(4.26)*	*(3.26)*	*(2.40)*	*(1.73)*	*(1.23)*	*(0.88)*	*(0.65)*
12.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(7.72)	*(7.40)*	*(6.95)*	*(6.34)*	*(5.57)*	*(4.68)*	*(3.74)*	*(2.86)*	*(2.11)*	*(1.52)*	*(1.08)*	*(0.78)*	*(0.57)*
14.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(6.79)	*(6.51)*	*(6.11)*	*(5.57)*	*(4.89)*	*(4.11)*	*(3.29)*	*(2.52)*	*(1.85)*	*(1.33)*	*(0.95)*	*(0.68)*	*(0.50)*
15.0	6.36	6.10	5.73	5.22	4.59	3.85	3.08	2.36	1.74	1.25	0.89	0.64	0.47
16.0	5.97	5.72	5.37	4.90	4.30	3.61	2.89	2.21	1.63	1.17	0.84	0.60	0.44
18.0	5.25	5.03	4.72	4.31	3.78	3.18	2.54	1.94	1.43	1.03	0.73	0.53	0.39
20.0	4.61	4.42	4.15	3.78	3.32	2.79	2.23	1.71	1.26	0.91	0.65	0.46	0.34
22.0	4.05	3.89	3.65	3.33	2.92	2.45	1.96	1.50	1.11	0.80	0.57	0.41	0.30
24.0	3.56	3.42	3.21	2.92	2.57	2.16	1.73	1.32	0.97	0.70	0.50	0.36	0.26
26.0	3.13	3.00	2.82	2.57	2.26	1.90	1.52	1.16	0.86	0.62	0.44	0.32	0.23
28.0	2.75	2.64	2.48	2.26	1.98	1.67	1.33	1.02	0.75	0.54	0.39	0.28	0.20
30.0	2.42	2.32	2.18	1.99	1.74	1.47	1.17	0.90	0.66	0.48	0.34	0.24	0.18

003.02B4 Little Blue River - Spring Creek to Big Sandy Creek (segment LB2-10000, Little Blue River Basin); Elkhorn River - Cedar Creek to Platte River (segments EL1-10000, EL1-20000, and EL4-10000, Elkhorn River Basin); Logan Creek - South Logan Creek to Elkhorn River (segments EL2-10000 and EL2-20000, Elkhorn River Basin); and South Logan Creek - Dog Creek to Logan Creek (segment EL2-20800, Elkhorn River Basin).

003.02B4a Total Ammonia (as nitrogen).

003.02B4a(1) One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (8.54)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.02B4a(1)(a) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	47.61
6.8	42.68
7.0	36.68
7.2	30.02
7.4	23.35
7.6	17.31
7.8	12.34
8.0	8.54
8.2	5.82
8.4	3.95
8.6	2.69
8.8	1.87
9.0	1.35

003.02B4a(2) Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 0.854\left(\text{Minimum of } \left\{2.85,\ \text{or } 1.45\cdot 10^{0.028\,(25\ -\ Temp)}\right\}\right)$$

during periods when early life stages are present (March through October), or

$$CCC = 0.854\left(1.45\cdot 10^{0.028\left(25\ -\ \text{Maximum of } \left\{Temp,\ \text{or } 7\right\}\right)}\right)$$

during periods when early life stages are absent (November through February.

003.02B4a(2)(a) The highest four-day average concentration within a thirty-day period shall not exceed 2.5 times the thirty-day criterion.

003.02B4a(2)(b) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs for periods when early life stages are present (March through October) and when early life stages are absent (November through February).

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)
Italicized numbers in parentheses apply when Early Life Stages are Absent (November through February). Early Life Stage Absent criteria are identical to Early Life Stages Present criteria at temperatures greater than 14.5°C.

Temperature (°C) \ pH	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
2.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
4.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
6.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
8.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(9.99)	*(9.58)*	*(9.00)*	*(8.20)*	*(7.21)*	*(6.05)*	*(4.84)*	*(3.70)*	*(2.73)*	*(1.96)*	*(1.40)*	*(1.01)*	*(0.74)*
10.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(8.79)	*(8.42)*	*(7.91)*	*(7.21)*	*(6.33)*	*(5.32)*	*(4.26)*	*(3.26)*	*(2.40)*	*(1.73)*	*(1.23)*	*(0.88)*	*(0.65)*
12.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(7.72)	*(7.40)*	*(6.95)*	*(6.34)*	*(5.57)*	*(4.68)*	*(3.74)*	*(2.86)*	*(2.11)*	*(1.52)*	*(1.08)*	*(0.78)*	*(0.57)*
14.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(6.79)	*(6.51)*	*(6.11)*	*(5.57)*	*(4.89)*	*(4.11)*	*(3.29)*	*(2.52)*	*(1.85)*	*(1.33)*	*(0.95)*	*(0.68)*	*(0.50)*
15.0	6.36	6.10	5.73	5.22	4.59	3.85	3.08	2.36	1.74	1.25	0.89	0.64	0.47
16.0	5.97	5.72	5.37	4.90	4.30	3.61	2.89	2.21	1.63	1.17	0.84	0.60	0.44
18.0	5.25	5.03	4.72	4.31	3.78	3.18	2.54	1.94	1.43	1.03	0.73	0.53	0.39
20.0	4.61	4.42	4.15	3.78	3.32	2.79	2.23	1.71	1.26	0.91	0.65	0.46	0.34
22.0	4.05	3.89	3.65	3.33	2.92	2.45	1.96	1.50	1.11	0.80	0.57	0.41	0.30
24.0	3.56	3.42	3.21	2.92	2.57	2.16	1.73	1.32	0.97	0.70	0.50	0.36	0.26
26.0	3.13	3.00	2.82	2.57	2.26	1.90	1.52	1.16	0.86	0.62	0.44	0.32	0.23
28.0	2.75	2.64	2.48	2.26	1.98	1.67	1.33	1.02	0.75	0.54	0.39	0.28	0.20
30.0	2.42	2.32	2.18	1.99	1.74	1.47	1.17	0.90	0.66	0.48	0.34	0.24	0.18

003.02B5 Salt Creek - Beal Slough to Platte River (segments LP2-10000 and LP2-20000, Lower Platte River Basin).

003.02B5a Total Ammonia (as nitrogen).

003.02B5a(1) One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (8.54)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.02B5a(1)(a) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	47.61
6.8	42.68
7.0	36.68
7.2	30.02
7.4	23.35
7.6	17.31
7.8	12.34
8.0	8.54
8.2	5.82
8.4	3.95
8.6	2.69
8.8	1.87
9.0	1.35

003.02B5a(2) Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 1.097\left(\text{Minimum of } \left\{2.85, \text{ or } 1.45\cdot 10^{0.028\,(25\,-\,\text{Temp})}\right\}\right)$$

during periods when early life stages are present (March through October), or

$$CCC = 1.097\left(1.45\cdot 10^{0.028\,(25\,-\,\text{Maximum of }\{\text{Temp, or } 7\})}\right)$$

during periods when early life stages are absent (November through February.

003.02B5a(2)(a) The highest four-day average concentration within a thirty-day period shall not exceed 2.5 times the thirty-day criterion.

003.02B5a(2)(b) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs for periods when early life stages are present (March through October) and when early life stages are absent (November through February).

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)
Italicized numbers in parentheses apply when Early Life Stages are Absent (November through February). Early Life Stage Absent criteria are identical to Early Life Stages Present criteria at temperatures greater than 14.5°C.

Temperature (°C)	pH 6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(13.69)	*(13.13)*	*(12.33)*	*(11.24)*	*(9.87)*	*(8.29)*	*(6.64)*	*(5.08)*	*(3.74)*	*(2.69)*	*(1.92)*	*(1.38)*	*(1.01)*
2.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(13.69)	*(13.13)*	*(12.33)*	*(11.24)*	*(9.87)*	*(8.29)*	*(6.64)*	*(5.08)*	*(3.74)*	*(2.69)*	*(1.92)*	*(1.38)*	*(1.01)*
4.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(13.69)	*(13.13)*	*(12.33)*	*(11.24)*	*(9.87)*	*(8.29)*	*(6.64)*	*(5.08)*	*(3.74)*	*(2.69)*	*(1.92)*	*(1.38)*	*(1.01)*
6.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(13.69)	*(13.13)*	*(12.33)*	*(11.24)*	*(9.87)*	*(8.29)*	*(6.64)*	*(5.08)*	*(3.74)*	*(2.69)*	*(1.92)*	*(1.38)*	*(1.01)*
8.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(12.84)	*(13.31)*	*(11.56)*	*(10.54)*	*(9.26)*	*(7.77)*	*(6.22)*	*(4.76)*	*(3.51)*	*(2.52)*	*(1.80)*	*(1.29)*	*(0.95)*
10.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(11.28)	*(10.82)*	*(10.16)*	*(9.26)*	*(8.14)*	*(6.83)*	*(5.47)*	*(4.18)*	*(3.08)*	*(2.22)*	*(1.58)*	*(1.14)*	*(0.84)*
12.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(9.92)	*(9.51)*	*(8.93)*	*(8.14)*	*(7.15)*	*(6.01)*	*(4.81)*	*(3.68)*	*(2.71)*	*(1.95)*	*(1.39)*	*(1.00)*	*(0.73)*
14.0	8.43	8.09	7.59	6.92	6.08	5.11	4.09	3.13	2.30	1.66	1.18	0.85	0.62
	(8.72)	*(8.36)*	*(7.85)*	*(7.16)*	*(6.29)*	*(5.28)*	*(4.23)*	*(3.23)*	*(2.38)*	*(1.71)*	*(1.22)*	*(0.88)*	*(0.65)*
15.0	8.18	7.84	7.36	6.71	5.89	4.95	3.96	3.03	2.23	1.61	1.15	0.82	0.61
16.0	7.66	7.35	6.90	6.29	5.53	4.64	3.72	2.84	2.09	1.51	1.07	0.77	0.57
18.0	6.74	6.46	6.06	5.53	4.86	4.08	3.27	2.50	1.84	1.32	0.94	0.68	0.50
20.0	5.92	5.68	5.33	4.86	4.27	3.59	2.87	2.20	1.62	1.16	0.83	0.60	0.44
22.0	5.21	4.99	4.69	4.27	3.75	3.15	2.52	1.93	1.42	1.02	0.73	0.52	0.39
24.0	4.58	4.39	4.12	3.76	3.30	2.77	2.22	1.70	1.25	0.90	0.64	0.46	0.34
26.0	4.02	3.86	3.62	3.30	2.90	2.44	1.95	1.49	1.10	0.79	0.56	0.41	0.30
28.0	3.54	3.39	3.18	2.90	2.55	2.14	1.71	1.31	0.97	0.69	0.50	0.36	0.26
30.0	3.11	2.98	2.80	2.55	2.24	1.88	1.51	1.15	0.85	0.61	0.44	0.31	0.23

003.02B5b Chloride.

Because these segments have high natural background concentrations of chloride and aquatic life has adapted to these conditions, criteria shall be based on natural background values.

003.02B6 Rock Creek (segments LP2-11000, LP2-11100, and LP2-11200, North Fork Rock Creek (segment LP2-11010), Ash Hollow Creek (segment LP2-11110), Little Rock Creek (segment LP2-11120), Jordan Creek (segment LP2-20100), Little Salt Creek (segment LP2-20300), Oak Creek - Elk Creek to Salt Creek (segment LP2-20500), Middle Creek - South Branch Middle Creek to Salt Creek (segment LP2-21000), Haines Branch - Holmes Creek to Salt Creek (segment 21200), and Holmes Creek (segment LP2-21210). All segments are within the Lower Platte River Basin.

003.02B6a Chloride.

Because these segments have high natural background concentrations of chloride and aquatic life has adapted to these conditions, criteria shall be based on natural background values.

003.03 Coldwater Aquatic Life Use Class Specific Criteria.

These are waters which provide, or could provide, a habitat consisting of sufficient water volume or flow, water quality, and other characteristics such as substrate composition which are capable of maintaining year-round populations of coldwater biota. Coldwater biota are considered to be life forms in waters where temperatures seldom exceed 25°C (77°F).

003.03A Class A - Coldwater.

These waters provide a habitat which supports natural reproduction of a salmonid (trout) population. These waters also are capable of maintaining year-round populations of a variety of other coldwater fish and associated vertebrate and invertebrate organisms and plants.

003.03A1 Dissolved Oxygen.

003.03A1a One-day minimum of not less than 8.0 mg/l for salmonid early-life stages. This criterion applies from October 1 through May 31.

003.03A1b One-day minimum of not less than 4.0 mg/l for all life stages other than salmonid early-life stages. This criterion applies from June 1 through September 30.

003.03A1c Seven-day mean minimum of not less than 5.0 mg/l. This criterion applies from June 1 through September 30.

003.03A1d Seven-day mean of not less than 9.5 mg/l for salmonid early-life stages. This criterion applies from October 1 through May 31.

003.03A1e Thirty-day mean of not less than 6.5 mg/l. This criterion applies from June 1 through September 30.

003.03A2 Total Ammonia (as nitrogen).

003.03A2a One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (5.62)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.03A2a(1) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	31.30
6.8	28.06
7.0	24.12
7.2	19.74
7.4	15.35
7.6	11.38
7.8	8.11
8.0	5.62
8.2	3.83
8.4	2.59
8.6	1.77
8.8	1.23
9.0	0.89

003.03A2b Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 0.854\left(\text{Minimum of } \left\{2.85, \text{ or } 1.45\cdot 10^{0.028\,(25\,-\,Temp)}\right\}\right)$$

003.03A2b(1) The highest four-day average concentration within a thirty-day period shall not exceed 2.5 times the thirty-day criterion.

003.03A2b(2) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs.

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)
Coldwater Aquatic Life Use Class

Temperature (°C)	pH 6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
2.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
4.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
6.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
8.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
10.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
12.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
14.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
15.0	6.36	6.10	5.73	5.22	4.59	3.85	3.08	2.36	1.74	1.25	0.89	0.64	0.47
16.0	5.97	5.72	5.37	4.90	4.30	3.61	2.89	2.21	1.63	1.17	0.84	0.60	0.44
18.0	5.25	5.03	4.72	4.31	3.78	3.18	2.54	1.94	1.43	1.03	0.73	0.53	0.39
20.0	4.61	4.42	4.15	3.78	3.32	2.79	2.23	1.71	1.26	0.91	0.65	0.46	0.34
22.0	4.05	3.89	3.65	3.33	2.92	2.45	1.96	1.50	1.11	0.80	0.57	0.41	0.30
24.0	3.56	3.42	3.21	2.92	2.57	2.16	1.73	1.32	0.97	0.70	0.50	0.36	0.26
26.0	3.13	3.00	2.82	2.57	2.26	1.90	1.52	1.16	0.86	0.62	0.44	0.32	0.23
28.0	2.75	2.64	2.48	2.26	1.98	1.67	1.33	1.02	0.75	0.54	0.39	0.28	0.20
30.0	2.42	2.32	2.18	1.99	1.74	1.47	1.17	0.90	0.66	0.48	0.34	0.24	0.18

003.03A3 Toxic Substances.

003.03A3a The following numerical criteria shall not be exceeded.

POLLUTANT	CRITERIA (ug/l) Acute	Chronic
Metals and Inorganics[1]:		
Cadmium[2]	$(\text{ACF})e^{(1.0166[\ln hardness]-3.924)}$ [a]	$(\text{CCF})e^{(0.7409[\ln hardness]-4.719)}$ [b]
Chromium (III)	$(0.316)e^{(0.819[\ln hardness]+3.7256)}$ [a]	$(0.860)e^{(0.819[\ln hardness]+0.6848)}$ [b]
Chromium (VI)	16[a]	11[b]
Cyanide	22[a]	5.2[b]

[a] One-hour average concentration
[b] Four-day average concentration
[1] Criteria for metals and inorganics apply to dissolved concentrations
[2] The conversion factors for cadmium are hardness dependent and defined by:
ACF = 1.136672-[ln *hardness* (0.041838)]
CCF = 1.101672-[ln *hardness* (0.041838)]

003.03B Class B - Coldwater.

These are waters which provide, or could provide, a habitat capable of maintaining year-round populations of a variety of coldwater fish and associated vertebrate and invertebrate organisms and plants or which support the seasonal migration of salmonids. These waters do not support natural reproduction of salmonid populations due to limitations of flow, substrate composition, or other habitat conditions, but salmonid populations may be maintained year-round if periodically stocked.

003.03B1 Dissolved Oxygen.

003.03B1a One-day minimum of not less than 5.0 mg/l for coldwater fish early-life stages. This criterion applies from April 1 through June 30.

003.03B1b One-day minimum of not less than 4.0 mg/l for all life stages other than coldwater fish early-life stages. This criterion applies from July 1 through March 31.

003.03B1c Seven-day mean minimum of not less than 5.0 mg/l. This criterion applies from July 1 through March 31.

003.03B1d Seven-day mean of not less than 6.5 mg/l for coldwater fish early-life stages. This criterion applies from April 1 through June 30.

003.03B1e Thirty-day mean of not less than 6.5 mg/l. This criterion applies from July 1 through March 31.

003.03B2 Total Ammonia (as nitrogen).

003.03B2a One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (5.62)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.03B2a(1) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	31.30
6.8	28.06
7.0	24.12
7.2	19.74
7.4	15.35
7.6	11.38
7.8	8.11
8.0	5.62
8.2	3.83
8.4	2.59
8.6	1.77
8.8	1.23
9.0	0.89

003.03B2b Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 0.854\left(\text{Minimum of } \left\{2.85, \text{ or } 1.45\cdot 10^{0.028\,(25\,-\,Temp)}\right\}\right)$$

003.03B2b(1) The highest four-day average concentration within a thirty-day period shall not exceed 2.5 times the thirty-day criterion.

003.03B2b(2) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs.

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)
Coldwater Aquatic Life Use Class

	pH												
Temperature (°C)	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
2.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
4.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
6.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
8.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
10.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
12.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
14.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
15.0	6.36	6.10	5.73	5.22	4.59	3.85	3.08	2.36	1.74	1.25	0.89	0.64	0.47
16.0	5.97	5.72	5.37	4.90	4.30	3.61	2.89	2.21	1.63	1.17	0.84	0.60	0.44
18.0	5.25	5.03	4.72	4.31	3.78	3.18	2.54	1.94	1.43	1.03	0.73	0.53	0.39
20.0	4.61	4.42	4.15	3.78	3.32	2.79	2.23	1.71	1.26	0.91	0.65	0.46	0.34
22.0	4.05	3.89	3.65	3.33	2.92	2.45	1.96	1.50	1.11	0.80	0.57	0.41	0.30
24.0	3.56	3.42	3.21	2.92	2.57	2.16	1.73	1.32	0.97	0.70	0.50	0.36	0.26
26.0	3.13	3.00	2.82	2.57	2.26	1.90	1.52	1.16	0.86	0.62	0.44	0.32	0.23
28.0	2.75	2.64	2.48	2.26	1.98	1.67	1.33	1.02	0.75	0.54	0.39	0.28	0.20
30.0	2.42	2.32	2.18	1.99	1.74	1.47	1.17	0.90	0.66	0.48	0.34	0.24	0.18

003.03B3 Toxic Substances.

003.03B3a The following numerical criteria shall not be exceeded.

POLLUTANT	CRITERIA (ug/l) Acute	Chronic
Metals and Inorganics[1]:		
Cadmium[2]	$(\text{ACF})e^{(1.0166[\ln hardness]-3.924)}$ [a]	$(\text{CCF})e^{(0.7409[\ln hardness]-4.719)}$ [b]
Chromium (III)	$(0.316)e^{(0.819[\ln hardness]+3.7256)}$ [a]	$(0.860)e^{(0.819[\ln hardness]+0.6848)}$ [b]
Chromium (VI)	16[a]	11[b]
Cyanide	22[a]	5.2[b]

[a] One-hour average concentration
[b] Four-day average concentration
[1] Criteria for metals and inorganics apply to dissolved concentrations
[2] The conversion factors for cadmium are hardness dependent and defined by:
ACF = 1.136672-[ln *hardness* (0.041838)]
CCF = 1.101672-[ln *hardness* (0.041838)]

003.04 Warmwater Aquatic Life Use Class Specific Criteria.

These are waters which provide, or could provide, a habitat consisting of sufficient water volume or flow, water quality, and other characteristics such as substrate composition which are capable of maintaining year-round populations of warmwater biota. Warmwater biota are considered to be life forms in waters where temperatures frequently exceed 25°C (77°F).

003.04A Class A - Warmwater.

These waters provide, or could provide, a habitat suitable for maintaining one or more identified key species on a year-round basis. These waters also are capable of maintaining year-round populations of a variety of other warmwater fish and associated vertebrate and invertebrate organisms and plants.

003.04A1 Dissolved Oxygen.

003.04A1a One-day minimum of not less than 5.0 mg/l for early-life stages. This criterion applies from April 1 through September 30.

003.04A1b One-day minimum of not less than 3.0 mg/l for all life stages other than early-life stages. This criterion applies from October 1 through March 31.

003.04A1c Seven-day mean minimum of not less than 4.0 mg/l. This criterion applies from October 1 through March 31.

003.04A1d Seven-day mean of not less than 6.0 mg/l for early-life stages. This criterion applies from April 1 through September 30.

003.04A1e Thirty-day mean of not less than 5.5 mg/l. This criterion applies from October 1 through March 31.

003.04A2 Total Ammonia (as nitrogen).

003.04A2a One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (8.40)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.04A2a(1) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	46.83
6.8	41.98
7.0	36.08
7.2	29.96
7.4	22.96
7.6	17.03
7.8	12.13
8.0	8.40
8.2	5.72
8.4	3.88
8.6	2.65
8.8	1.84
9.0	1.32

003.04A2b Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 0.854\left(\text{Minimum of } \left\{2.85, \text{ or } 1.45\cdot 10^{0.028\,(25 - Temp)}\right\}\right)$$

during periods when early life stages are present (March through October), or

$$CCC = 0.854\left(1.45\cdot 10^{0.028\left(25 - \text{Maximum of } \left\{Temp, \text{ or } 7\right\}\right)}\right)$$

during periods when early life stages are absent (November through February.

003.04A2b(1) The highest four-day average concentration within a thirty-day period shall not exceed 2.5 times the thirty-day criterion.

003.04A2b(2) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs for periods when early life stages are present (March through October) and when early life stages are absent (November through February).

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)

Italicized numbers in parentheses apply when Early Life Stages are Absent (November through February). Early Life Stage Absent criteria are identical to Early Life Stages Present criteria at temperatures greater than 14.5°C.

Temperature (°C)	pH 6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
2.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
4.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
6.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
8.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(9.99)	*(9.58)*	*(9.00)*	*(8.20)*	*(7.21)*	*(6.05)*	*(4.84)*	*(3.70)*	*(2.73)*	*(1.96)*	*(1.40)*	*(1.01)*	*(0.74)*
10.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(8.79)	*(8.42)*	*(7.91)*	*(7.21)*	*(6.33)*	*(5.32)*	*(4.26)*	*(3.26)*	*(2.40)*	*(1.73)*	*(1.23)*	*(0.88)*	*(0.65)*
12.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(7.72)	*(7.40)*	*(6.95)*	*(6.34)*	*(5.57)*	*(4.68)*	*(3.74)*	*(2.86)*	*(2.11)*	*(1.52)*	*(1.08)*	*(0.78)*	*(0.57)*
14.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(6.79)	*(6.51)*	*(6.11)*	*(5.57)*	*(4.89)*	*(4.11)*	*(3.29)*	*(2.52)*	*(1.85)*	*(1.33)*	*(0.95)*	*(0.68)*	*(0.50)*
15.0	6.36	6.10	5.73	5.22	4.59	3.85	3.08	2.36	1.74	1.25	0.89	0.64	0.47
16.0	5.97	5.72	5.37	4.90	4.30	3.61	2.89	2.21	1.63	1.17	0.84	0.60	0.44
18.0	5.25	5.03	4.72	4.31	3.78	3.18	2.54	1.94	1.43	1.03	0.73	0.53	0.39
20.0	4.61	4.42	4.15	3.78	3.32	2.79	2.23	1.71	1.26	0.91	0.65	0.46	0.34
22.0	4.05	3.89	3.65	3.33	2.92	2.45	1.96	1.50	1.11	0.80	0.57	0.41	0.30
24.0	3.56	3.42	3.21	2.92	2.57	2.16	1.73	1.32	0.97	0.70	0.50	0.36	0.26
26.0	3.13	3.00	2.82	2.57	2.26	1.90	1.52	1.16	0.86	0.62	0.44	0.32	0.23
28.0	2.75	2.64	2.48	2.26	1.98	1.67	1.33	1.02	0.75	0.54	0.39	0.28	0.20
30.0	2.42	2.32	2.18	1.99	1.74	1.47	1.17	0.90	0.66	0.48	0.34	0.24	0.18

003.04A3 Toxic Substances.

003.04A3a The following numerical criteria shall not be exceeded.

POLLUTANT	CRITERIA (ug/l) Acute	Chronic
Metals and Inorganics[1]:		
Cadmium[2]	$(\text{ACF})e^{(1.0166[\ln hardness]-2.849)}$ [a]	$(\text{CCF})e^{(0.7409[\ln hardness]-4.719)}$ [b]
Chromium (III)	$(0.316)e^{(0.819[\ln hardness]+3.764)}$ [a]	$(0.860)e^{(0.819[\ln hardness]+0.724)}$ [b]
Chromium (VI)	16[a]	11[b]
Cyanide	41.3[a]	9.8[b]

[a] One-hour average concentration
[b] Four-day average concentration
[1] Criteria for metals and inorganics apply to dissolved concentrations
[2] The conversion factors for cadmium are hardness dependent and defined by:
ACF = 1.136672-[ln *hardness* (0.041838)]
CCF = 1.101672-[ln *hardness* (0.041838)]

003.04B Class B - Warmwater.

These are waters where the variety of warmwater biota is presently limited by water volume or flow, water quality (natural or irretrievable human-induced conditions), substrate composition, or other habitat conditions. These waters are only capable of maintaining year-round populations of tolerant warmwater fish and associated vertebrate and invertebrate organisms and plants. Key species may be supported on a seasonal or intermittent basis (e.g., during high flows) but year-round populations cannot be maintained.

003.04B1 Dissolved Oxygen.

003.04B1a One-day minimum of not less than 5.0 mg/l for early-life stages. This criterion applies from April 1 through September 30.

003.04B1b One-day minimum of not less than 3.0 mg/l for all life stages other than early-life stages. This criterion applies from October 1 through March 31.

003.04B1c Seven-day mean minimum of not less than 4.0 mg/l. This criterion applies from October 1 through March 31.

003.04B1d Seven-day mean of not less than 6.0 mg/l for early-life stages. This criterion applies from April 1 through September 30.

003.04B1e Thirty-day mean of not less than 5.5 mg/l. This criterion applies from October 1 through March 31.

003.04B2 Total Ammonia (as nitrogen).

003.04B2a One-hour average concentration in mg/l not to exceed the numerical value given by

$$AV = (9.91)\left(\frac{0.0489}{1+10^{7.204-pH}} + \frac{6.95}{1+10^{pH-7.204}}\right)$$

003.04B2a(1) The following table shows one-hour average criteria for total ammonia at various pHs.

pH	Total Ammonia mg/l
6.6	55.25
6.8	49.53
7.0	42.57
7.2	34.84
7.4	27.09
7.6	20.09
7.8	14.32
8.0	9.92
8.2	6.75
8.4	4.58
8.6	3.13
8.8	2.18
9.0	1.56

003.04B2b Thirty-day average concentration in mg/l not to exceed the numerical value given by

$$CV = CCC\left(\frac{0.0676}{1+10^{7.688-pH}} + \frac{2.91}{1+10^{pH-7.688}}\right)$$

where Temp is °C and:

$$CCC = 0.854\left(\text{Minimum of } \left\{2.85, \text{ or } 1.45\cdot 10^{0.028(25 - Temp)}\right\}\right)$$

during periods when early life stages are present (March through October), or

$$CCC = 0.854\left(1.45\cdot 10^{0.028\left(25 - \text{Maximum of } \left\{Temp, \text{ or } 7\right\}\right)}\right)$$

during periods when early life stages are absent (November through February.

003.04B2b(1) The highest four-day average concentration within a thirty-day period shall not exceed 2.5 times the thirty-day criterion.

003.04B2b(2) The following table shows thirty-day average criteria for total ammonia at various temperatures and pHs for periods when early life stages are present (March through October) and when early life stages are absent (November through February).

THIRTY-DAY AVERAGE CRITERIA FOR TOTAL AMMONIA (mg/l)
Italicized numbers in parentheses apply when Early Life Stages are Absent (November through February). Early Life Stage Absent criteria are identical to Early Life Stages Present criteria at temperatures greater than 14.5°C.

Temperature (°C)	pH 6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.6	8.8	9.0
0.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
2.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
4.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
6.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(10.66)	*(10.22)*	*(9.60)*	*(8.75)*	*(7.69)*	*(6.46)*	*(5.17)*	*(3.95)*	*(2.91)*	*(2.09)*	*(1.49)*	*(1.07)*	*(0.79)*
8.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(9.99)	*(9.58)*	*(9.00)*	*(8.20)*	*(7.21)*	*(6.05)*	*(4.84)*	*(3.70)*	*(2.73)*	*(1.96)*	*(1.40)*	*(1.01)*	*(0.74)*
10.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(8.79)	*(8.42)*	*(7.91)*	*(7.21)*	*(6.33)*	*(5.32)*	*(4.26)*	*(3.26)*	*(2.40)*	*(1.73)*	*(1.23)*	*(0.88)*	*(0.65)*
12.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(7.72)	*(7.40)*	*(6.95)*	*(6.34)*	*(5.57)*	*(4.68)*	*(3.74)*	*(2.86)*	*(2.11)*	*(1.52)*	*(1.08)*	*(0.78)*	*(0.57)*
14.0	6.56	6.29	5.91	5.39	4.73	3.98	3.18	2.43	1.79	1.29	0.92	0.66	0.49
	(6.79)	*(6.51)*	*(6.11)*	*(5.57)*	*(4.89)*	*(4.11)*	*(3.29)*	*(2.52)*	*(1.85)*	*(1.33)*	*(0.95)*	*(0.68)*	*(0.50)*
15.0	6.36	6.10	5.73	5.22	4.59	3.85	3.08	2.36	1.74	1.25	0.89	0.64	0.47
16.0	5.97	5.72	5.37	4.90	4.30	3.61	2.89	2.21	1.63	1.17	0.84	0.60	0.44
18.0	5.25	5.03	4.72	4.31	3.78	3.18	2.54	1.94	1.43	1.03	0.73	0.53	0.39
20.0	4.61	4.42	4.15	3.78	3.32	2.79	2.23	1.71	1.26	0.91	0.65	0.46	0.34
22.0	4.05	3.89	3.65	3.33	2.92	2.45	1.96	1.50	1.11	0.80	0.57	0.41	0.30
24.0	3.56	3.42	3.21	2.92	2.57	2.16	1.73	1.32	0.97	0.70	0.50	0.36	0.26
26.0	3.13	3.00	2.82	2.57	2.26	1.90	1.52	1.16	0.86	0.62	0.44	0.32	0.23
28.0	2.75	2.64	2.48	2.26	1.98	1.67	1.33	1.02	0.75	0.54	0.39	0.28	0.20
30.0	2.42	2.32	2.18	1.99	1.74	1.47	1.17	0.90	0.66	0.48	0.34	0.24	0.18

003.04B3 Toxic Substances.

003.04B3a The following numerical criteria shall not be exceeded.

POLLUTANT	CRITERIA (ug/l) Acute	Chronic
Metals and Inorganics[1]:		
Cadmium[2]	$(\text{ACF})e^{(1.0166[\ln \textit{hardness}]-2.849)}$ [a]	$(\text{CCF})e^{(0.7409[\ln \textit{hardness}]-4.719)}$ [b]
Chromium (III)	$(0.316)e^{(0.819[\ln \textit{hardness}]+3.764)}$ [a]	$(0.860)e^{(0.819[\ln \textit{hardness}]+0.724)}$ [b]
Chromium (VI)	16[a]	11[b]
Cyanide	41.3[a]	9.8[b]

[a] One-hour average concentration
[b] Four-day average concentration
[1] Criteria for metals and inorganics apply to dissolved concentrations
[2] The conversion factors for cadmium are hardness dependent and defined by:
ACF = 1.136672-[ln *hardness* (0.041838)]
CCF = 1.101672-[ln *hardness* (0.041838)]

003.05 Nutrient Criteria for Lakes and Impounded Waters.

The following criteria associated with various nutrient classifications shall apply to lakes or impounded waters according to codes listed in Chapter 6. Where no classification has been specified for a lake or impounded water, criteria associated with the statewide default classification shall apply. Criteria are based on seasonal averages from April 1 through September 30.

Lake or Impounded Waters Classification:	Codes	Total Phosphorus (ug/l)	Total Nitrogen (ug/l)	Chlorophyll a (ug/l)
Reservoirs:	R1	54	1310	7
	R2	54	1310	7
	R3	112	570	8
	R4	1050	1980	5
	R5	69	660	24
	R6	54	1310	7
	R7	37	610	7
	R8	38	610	11
	R9	62	570	8
	R10	38	520	9
	R11	131	600	11
	R12	134	1460	44
	R13	143	1540	16
	R14	134	1460	44
	R15	133	1460	44
	R16	111	1070	30
	R17	134	1460	44
	R18	139	1460	44
	R19	873	1980	5
	R20	746	1980	5
	R21	709	1980	5
	R22	873	2760	14
Sandpits:	SP	95	1240	49
SandHills:	SH	3000	38960	341
Statewide Default:	SW	564	2300	29

004 Water Supply.

004.01 Public Drinking Water.

These are surface waters which serve as a public drinking water supply. These waters must be treated (e.g., coagulation, sedimentation, filtration, chlorination) before the water is suitable for human consumption. After treatment, these waters are suitable for drinking water, food processing, and similar uses.

004.01A General Criteria.

Wastes or toxic substances introduced directly or indirectly by human activity in concentrations that would degrade the use (i.e., would produce undesirable physiological effects in humans) shall not be allowed.

004.01B Numerical Criteria.

Numerical criteria for the parameters listed below shall not be exceeded. Any substance introduced directly or indirectly by human activity shall not be allowed to enter surface water if one or more of the following numerical standards would be exceeded. The numerical standards listed below are intended to protect beneficial use of public drinking water supply. If the natural background level of a parameter is greater than the numerical standard, this shall not in and of itself prohibit the use of the surface water. If the natural background level of a parameter is greater than the numerical standard listed below, the background level shall be used in place of the numerical criteria.

POLLUTANT	NUMERICAL LIMIT
Inorganics:	
Antimony	0.006 mg/l
Arsenic	0.010 mg/l
Asbestos	7 million fibers/liter with fiber length >10 microns
Barium	2.0 mg/l
Beryllium	0.004 mg/l
Cadmium	0.005 mg/l
Chromium	0.1 mg/l
Cyanide (as free cyanide)	0.2 mg/l
Fluoride	4.0 mg/l
Mercury	0.002 mg/l
Nitrate-nitrogen	10 mg/l
Nitrite-nitrogen	1 mg/l
Selenium	0.05 mg/l
Thallium	0.002 mg/l
Organics:	
Alachlor	0.002 mg/l
Atrazine	0.003 mg/l
Benzene	0.005 mg/l
Benzo(a)pyrene	0.0002 mg/l
Carbofuran	0.04 mg/l
Carbon tetrachloride	0.005 mg/l
Chlorobenzene	0.1 mg/l
Chlordane	0.002 mg/l
cis-1,2-Dichloroethylene	0.07 mg/l
Dalapon	0.2 mg/l
Dibromochloropropane (DBCP)	0.0002 mg/l
Dichloromethane	0.005 mg/l
Di(2-ethylhexyl)adipate	0.4 mg/l
Di(2-ethylhexyl)phthalate	0.006 mg/l
Dinoseb	0.007 mg/l
Dioxin (2,3,7,8-TCDD)	0.00000003mg/l

POLLUTANT	NUMERICAL LIMIT
Diquat	0.02 mg/l
Endothall	0.1mg/l
Endrin	0.002 mg/l
Ethylbenzene	0.7 mg/l
Ethylene dibromide	0.00005 mg/l
Glyphosate	0.7 mg/l
Heptachlor	0.0004 mg/l
Heptachlor epoxide	0.0002 mg/l
Hexachlorobenzene	0.001 mg/l
Hexachlorocyclopentadiene	0.05 mg/l
Lindane	0.0002 mg/l
Methoxychlor	0.04 mg/l
o-Dichlorobenzene	0.6 mg/l
Oxamyl (Vydate)	0.2 mg/l
2,4,5-TP Silvex	0.05 mg/l
2,4-D	0.07 mg/l
PCB’s	0.0005 mg/l
Pentachlorophenol	0.001 mg/l
Picloram	0.5 mg/l
Simazine	0.004 mg/l
Styrene	0.1 mg/l
trans-1,2-Dichloroethylene	0.1 mg/l
1,2,4-Trichlorobenzene	0.07 mg/l
Trichloroethylene	0.005 mg/l
Tetrachloroethylene	0.005 mg/l
Toluene	1.0 mg/l
Total trihalomethanes	0.1 mg/l
Toxaphene	0.003 mg/l
Vinyl chloride	0.002 mg/l
Xylenes	10.0 mg/l
1,2-Dichloropropane	0.005 mg/l
1,2-Dichloroethane	0.005 mg/l
1,1-Dichloroethylene	0.007 mg/l
1,1,1-Trichloroethane	0.2 mg/l
1,1,2-Trichloroethane	0.005 mg/l
p-Dichlorobenzene	0.075 mg/l

POLLUTANT	NUMERICAL LIMIT
Radionuclides:	
Beta particles and photon emitters	4 millirems per year
Combined radium-226 and radium-228	5 pCi/l
Gross alpha particle activity (including radium-226 but excluding radon and uranium)	15 pCi/l
Uranium	0.030 mg/l
Other Parameters Affecting Use:	
Aluminum	0.2 mg/l
Chloride	250 mg/l
Copper	1 mg/l
Foaming Agents (methylene-blue active substances)	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Silver	0.10 mg/l
Sulfate	250 mg/l
Total Dissolved Solids	500 mg/l
Zinc	5 mg/l
Other Priority Pollutants	
Acrolein [a]	0.32 mg/l
Acrylonitrile [b]	0.00059 mg/l
Bromoform [b]	0.043 mg/l
Chlorodibromomethane [b]	0.0041 mg/l
Chloroform [b]	0.057 mg/l
Dichlorobromomethane [b]	0.0056 mg/l
1,3-Dichloropropene [a]	0.010 mg/l
Methyl Bromide [a]	0.048 mg/l
1,1,2,2-Tetrachloroethane [b]	0.0017 mg/l
2-Chlorophenol [a]	0.12 mg/l

POLLUTANT	NUMERICAL LIMIT
2,4-Dichlorophenol [a]	0.093 mg/l
2,4-Dimethylphenol [a]	0.54 mg/l
2-Methyl-4,6-Dinitrophenol [a]	0.0134 mg/l
2,4-Dinitrophenol [a]	0.07 mg/l
Phenol [a]	21 mg/l
2,4,6-Trichlorophenol [b]	0.021 mg/l
Acenaphthene [a]	1.2 mg/l
Anthracene [a]	9.6 mg/l
Benzidine [b]	0.0000012 mg/l
Benzo(a)Anthracene [b]	0.000044 mg/l
Benzo(b)Fluoranthene [b]	0.000044 mg/l
Benzo(k)Fluoranthene [b]	0.000044 mg/l
Bis2-Chloroethyl Ether [b]	0.00031 mg/l
Bis2-Chloroisopropyl Ether [a]	1.4 mg/l
Butylbenzyl Phthalate [a]	3 mg/l
2-Chloronaphthalene [a]	1.7 mg/l
Chrysene [b]	0.000044 mg/l
Dibenzo(a,h)Anthracene [b]	0.000044 mg/l
1,3-Dichlorobenzene [a]	0.4 mg/l
3,3’-Dichlorobenzidine [b]	0.0004 mg/l
Diethyl Phthalate [a]	23 mg/l
Dimethyl Phthalate [a]	313 mg/l
Di-n-Butyl Phthalate [a]	2.7 mg/l
2,4-Dinitro toluene [b]	0.0011 mg/l
1,2-Diphenlyhydrazine [b]	0.0004 mg/l
Fluoranthene [a]	0.3 mg/l
Fluorene [a]	1.3 mg/l
Hexachlorobutadiene [b]	0.0044 mg/l
Hexachloroethane [b]	0.019 mg/l
Ideno 1,2,3-cdPyrene [b]	0.000044 mg/l
Isophorone [b]	0.36 mg/l
Nitrobenzene [a]	0.017 mg/l
N-Nitrosodimethylamine [b]	0.0000069 mg/l
N-Nitrosodi-n-Propylamine [b]	0.00005 mg/l
N_Nitrosodiphenylamine [b]	0.05 mg/l
Pyrene [a]	0.96 mg/l

POLLUTANT	NUMERICAL LIMIT
Aldrin [b]	0.0000013 mg/l
alpha-BHC [b]	0.000039 mg/l
beta-BHC [b]	0.00014 mg/l
4,4'-DDT [b]	0.0000059 mg/l
4,4'-DDE [b]	0.0000059 mg/l
4,4'-DDD [b]	0.0000083 mg/l
Dieldrin [b]	0.0000014 mg/l
alpha-Endosulfan [a]	0.11 mg/l
beta-Endosulfan [a]	0.11 mg/l
Endosulfan Sulfate [a]	0.11 mg/l
Endrin Aldehyde [a]	0.00076 mg/l

[a] Human health criteria based on the consumption of water, fish and other aquatic organisms
[b] Human health criteria at the 10^{-5} risk level for carcinogens based on the consumption of water, fish and other aquatic organisms

004.02 Agricultural.

004.02A General Criteria.

Wastes or toxic substances introduced directly or indirectly by human activity in concentrations that would degrade the use (i.e., would produce undesirable physiological effects in crops or livestock) shall not be allowed.

004.02B Class A - Agricultural.

These are waters used for general agricultural purposes (e.g., irrigation and livestock watering) without treatment.

004.02B1 Conductivity.

Not to exceed 2,000 umhos/cm between April 1 and September 30.

004.02B2 Nitrate and Nitrite as Nitrogen.

Not to exceed 100 mg/l.

004.02B3 Selenium.

Not to exceed 0.02 mg/l.

004.02C Class B - Agricultural.

These are waters where the natural background water quality limits its use for agricultural purposes. No water quality criteria are assigned to protect this use.

004.03 Industrial.

These are waters used for commercial or industrial purposes such as cooling water, hydroelectric power generation, or nonfood processing water; with or without treatment. Water quality criteria to protect this use will vary with the type of industry involved. Where water quality criteria are necessary to protect this use, site-specific criteria will be developed.

005 Aesthetics.

This use applies to all surface waters of the state. To be aesthetically acceptable, waters shall be free from human-induced pollution which causes: 1) noxious odors; 2) floating, suspended, colloidal, or settleable materials that produce objectionable films, colors, turbidity, or deposits; and 3) the occurrence of undesirable or nuisance aquatic life (e.g., algal blooms). Surface waters shall also be free of junk, refuse, and discarded dead animals.

Enabling Legislation: Neb. Rev. Stat. §§ 81-1505(1)(2)

Legal Citation: Title 117, Ch. 4, Nebraska Department of Environmental Quality